

CLAIMS

- 1) A pharmaceutical formulation comprising an oral dosage form containing a bisphosphonic acid or a salt thereof and an inactive ingredient selected from: an ester of a medium chain fatty acid, or a lipophilic polyethylene glycol ester, said inactive ingredient having a hydrophilic-lipophilic balance (HLB) of from about 1 to about 30.
- 2) A pharmaceutical formulation according to claim 1 wherein said bisphosphonic acid or salts thereof is a bone resorption inhibitor.
- 3) A pharmaceutical formulation according to any one of the preceding claims wherein said bone resorption inhibitor is useful in treating or preventing osteoporosis or diseases related to irregular osteoclast activity.
- 4) A pharmaceutical formulation according to any one of the preceding claims wherein said bisphosphonic acid or a salt thereof may be selected from the group consisting of ibandronate, alendronate, etidronate, risedronate, and tiludronate or a salt thereof.
- 5) A pharmaceutical formulation according to any one of claims 1-3 wherein said bisphosphonic acid or a salt thereof is zoledronic acid or a salt thereof.
- 6) A pharmaceutical formulation according to any one of the preceding claims wherein said inactive ingredient is a propylene glycol monoester of medium chain fatty acids (primarily caprylic acid).
- 7) A pharmaceutical formulation according to claim 6 wherein said inactive ingredient has an HLB of 4.4.
- 8) A pharmaceutical formulation according to any one of claims 1-5 wherein said inactive ingredient is D-alpha-tocopheryl polyethylene glycol 1000 succinate..
- 9) A pharmaceutical formulation according to any one of the preceding claims wherein said inactive ingredient is a combination of is a propylene glycol monoester of medium chain fatty acids (primarily caprylic acid) and D-alpha-tocopheryl polyethylene glycol 1000 succinate.
- 10) A pharmaceutical formulation according to to any one of the preceding claims wherein said dose of bisphosphonic acid or salt thereof is in the range of from about 0.01 mg/kg to about 500 mg/kg.

- 11) A pharmaceutical formulation according to any one of the preceding claims wherein said dose of bisphosphonic acid or salt thereof is in the range of from about 0.1 mg/kg to about 200 mg/kg.
- 12) A pharmaceutical formulation according to any one of the preceding claims wherein said dose of bisphosphonic acid or salt thereof is in the range of from about 0.2 mg/kg to about 100 mg/kg.
- 13) A method of treatment comprising administering an oral dosage form according to any one of the preceding claims in order to provide increased bioavailability or increased tolerability of said bisphosphonic acid or salt thereof.
- 14) A method according to claim 13 wherein said increased bioavailability is measured as increased absolute bioavailability.
- 15) A method according to claim 14 wherein said absolute bioavailability is in the range of from about 1% to about 50%.
- 16) A method according to claim 14 wherein said absolute bioavailability is in the range of from about 2.5% to about 30%.
- 17) A method according to claim 14 wherein said absolute bioavailability is in the range of from about 7.5% to about 20%.
- 18) A method according to claim 14 wherein said increased bioavailability is measured in said subject as a blood level C_{max} in the range of from about 1 to about 16,000 ng/mL.
- 19) A method according to claim 14 wherein said increased bioavailability is measured in said subject as a blood level C_{max} in the range of from about 10 to about 8,000 ng/mL.
- 20) A method according to claim 14 wherein said increased bioavailability is measured in said subject as a blood level AUC (0-24Hr) in the range of from about 100 to about 40,000 ng/hr/mL.
- 21) A method according to claim 14 wherein said increased bioavailability is measured in said subject as a blood level AUC (0-24Hr) in the range of from about 100 to about 20,000 ng/hr/mL.
- 22) A method according to claim 14 wherein said increased tolerability is measured as reduced gastrointestinal toxicity.

- 23) A method of treatment comprising administering a dosage form according to any one of claims 1-12 in order to provide increased bioavailability and increased tolerability of said bisphosphonic acid or salts thereof.
- 24) A process for preparing a formulation as defined in claim 1 comprising: suspending the bisphosphonic acid or a salt thereof in the inactive ingredient to produce a dispersion; and encapsulating the dispersion.
- 25) A process according to claim 23 wherein the inactive ingredient is pre-heated prior to suspending the bisphosphonic acid or salt thereof.
- 26) A process according to claim 23 or 24 wherein the dispersion is encapsulated in gelatin capsules.